Ameren Illinois Company's
Response to Illinois Office of Attorney General Data Request - AG-AIC 1
Grid Plan Workshops
Workshops under Sec. 16-105.17(e) to inform a Multi-Year Integrated Grid Plan
Dated Submitted: February 18, 2022

No.: AG-AIC 1.01

Refer to the Company's response to 83 IL Admin Code Part 475.100 dated December 13, 2021 generally.

a. For any underground metropolitan networks, such as those that might serve Springfield or East St. Louis, please complete the attached spreadsheet of data for underground network substations and circuits.
b. For all other substations and circuits, please complete the attached spreadsheet of data for non-network substations and circuits.

RESPONSE

Prepared By: Matthew Sensenbach
Title: Manager, Distribution Planning and Reliability
Phone No.: 1-618-301-5270

Ameren Illinois objects to this data request on the basis that it is overly broad and unduly burdensome. Ameren Illinois further objects to this request to the extent it assumes that the Company maintains the requested information in the ordinary course of business. Accordingly, Ameren Illinois objects to this request to the extent that it requires the Company to create new work product, and to the extent that it asks for new analyses and information that Ameren Illinois does not prepare or maintain in the ordinary course of business, and to the extent the data request is contrary to 83 Ill. Admin. Code Sec. 475.220(b)(8).

Ameren Illinois also objects to this data request because it asks for confidential load information on a per circuit basis. Furthermore, Ameren Illinois objects to this data request on the basis that it seeks SAIDI data that is currently the subject of active litigation in Docket No. 22-0063; accordingly, the provision of such information is inappropriate.

Ameren Illinois Company's
Response to Illinois Office of Attorney General Data Request - AG-AIC 1
Grid Plan Workshops
Workshops under Sec. 16-105.17(e) to inform a Multi-Year Integrated Grid Plan
Dated Submitted: February 18, 2022

No.: AG-AIC 1.02

Refer to the Company's response to 83 IL Admin Code Part 475.100 dated December 13, 2021 generally. Please list and briefly describe all software systems (including developer identity and versions) used to operate and or plan the distribution grid, such as Pi, Synergy, Cyme, NMS, OMS, GIS, ADMS, etc.

RESPONSE

Prepared By: Andy Parker
Title: Manager, DER Integrations Strategies
Phone No.: 618-610-1613

Ameren Illinois objects to this data request to the extent it seeks information not relevant to the workshop process, and to the extent it does not further discussion and consideration of Ameren Illinois' Electric Distribution System Planning in the workshops, pursuant to 83 Ill. Admin. Code Sec. 475.220(b)(8). Ameren Illinois further objects to this request to the extent it seeks highly sensitive and confidential information that could pose a significant risk to the security of Ameren Illinois' system, and to the extent the information sought is not likely to aid in the objectives set forth in 220 ILCS 5/16-105.17(e)(2).

Ameren Illinois Company's
Response to Illinois Office of Attorney General Data Request - AG-AIC 1
Grid Plan Workshops
Workshops under Sec. 16-105.17(e) to inform a Multi-Year Integrated Grid Plan
Dated Submitted: February 18, 2022

No.: AG-AIC 1.03

Refer to the Company's response to 83 IL Admin Code Part 475.100 dated December 13, 2021 generally. Please list and describe any automated field hardware systems that are presently used on the distribution system, such as Intelliteam or other automated or remotely controlled or operated switching or reclosing equipment.

RESPONSE

Prepared By: Matthew Sensenbach
Title: Manager, Distribution Planning and Reliability
Phone No.: 1-618-301-5270

Prepared By: Troy Tipsword
Title: Manager, Distribution Automation and Grid Technology Operations
Phone: 1-309-303-7118

Ameren Illinois objects to this data request to the extent it seeks information not relevant to the workshop process, and to the extent it does not further discussion and consideration of Ameren Illinois' Electric Distribution System Planning in the workshops, pursuant to 83 Ill. Admin. Code Sec. 475.220(b)(8). Subject to and without waiving these objections, AIC states as follows:

1. S&C 15KV and 38KV IntelliRupter reclosers using IntelliTeam for automated self-healing circuit transfer capability and fault isolation.

2. G&W Diamondback auto sectionalizer switch.Several Diamondback auto sectionalizer switches also have S&C IntelliTeam capabilities for direct transfer trip and auto restoration.

3. S&C TripSaver cutout mounted recloser.

4. S&C pad mounted switchgear with using IntelliTeam for automated self-healing circuits, automated auto transfer schemes, and fault isolation.

5. S&C Vista underground switchgear using IntelliTeam for automated self-healing circuits and fault isolation.

6. 38KV and 69KV motor operated line switches. Several of these switches also include line fault indicators to assist with faster fault isolation. Some switches include a SEL 2411 programmable automated controller to provide local automatic line sectionalizing and auto transfer capability.

7. G&W Lazer centralized automation software to automatically control 69KV motor operated line switches to isolate faults and improve restoration times.

8. G&W 38KV Vipers utilized as line reclosers, auto sectionalizers, and in automated auto transfer schemes. Some Vipers include S&C IntelliTeam automated transfer capabilities used for auto restoration.

9. G&W 15kV Vipers utilized as substation reclosers using IntelliTeam for automated self-healing circuit transfer capabilities and fault isolation with S&C 15kV Intellirupters on the circuit.

10. Eaton VaultGuard Gateways installed on underground network protectors to provide monitoring and control for network vault systems.

11. S&C / LG 1MW ESS – 1MW ESS Battery that automatically restores power to 95% of the customers on an Ameren 12KV circuit upon loss of source voltage from the substation.

Ameren Illinois Company's
Response to Illinois Office of Attorney General Data Request - AG-AIC 1
Grid Plan Workshops
Workshops under Sec. 16-105.17(e) to inform a Multi-Year Integrated Grid Plan
Dated Submitted: February 18, 2022

No.: AG-AIC 1.04

Refer to the Company's response to 83 IL Admin Code Part 475.100 dated December 13, 2021 (Ameren Illinois PUBLIC Response to Part 475.100 in Advance Stakeholder Process) and the table of projected capital expenditures by type on page 2.

a. Provide, in the exact same format, using the exact same types of expenditures listed, the Company's actual spending by type and by year from 2018 through 2021.
b. Provide both the above-referenced table, and the table provided in response to subpart (a) above, in MS Excel spreadsheet format.

RESPONSE

Prepared By: Scott A. Butkus
Title: Manager, Field Support and Analysis
Phone No.: 217-535-5044

Ameren Illinois objects to this data request to the extent it requires the Company to create a new document or provide any analysis that did not exist prior to the data requests, pursuant to 83 Ill. Admin. Code Sec. 475.220(b)(8). Subject to and without waiving these objections, Ameren Illinois states as follows:

See AG-AIC 1.04 Attach.

Note: This attachment is CONFIDENTIAL & PROPRIETARY and should be treated as such.

No.: AG-AIC 1.05

Refer to the Company's response to 83 IL Admin Code Part 475.100 dated December 13, 2021 (Ameren Illinois PUBLIC Response to Part 475.100 in Advance Stakeholder Process at page 5) and the statement "Using inspection results, health monitoring, engineering knowledge and operational expertise, assets with a higher risk of failure are identified and proactively replaced to ensure maximum operating reliability."

a. Provide the Company's policies and procedures regarding routine, periodic inspection and testing of significant substation assets (including power transformers, circuit breakers, and relays, at a minimum, plus any others the Company may test routinely).
b. Provide the Company's policies and procedures regarding routine, periodic inspection and testing of significant assets beyond the substation, if any.
c. List and describe all the data inputs into the Copperleaf C55 software. Specifically, please describe how i) inspection results; ii) health monitoring; iii) engineering knowledge; and iv) operational expertise are incorporated into "risk of failure" ratings.
d. Provide all Company-specified data and assumptions employed in the Copperleaf C55 software.
e. Provide a sample output of the Copperleaf C55 software the Company would use to identify assets "with a higher risk of failure" for a sample equipment type (for example, substation breakers, or substation power transformers).
f. Provide any analyses the Company has completed which indicate that the prospective replacement of assets within the five years from 2022 to 2027 identified as having a higher risk of failure delivers reliability benefits to customers in excess of incremental costs to customers. If the Company has not completed such an analysis, please explain why not.

RESPONSE

Prepared By: Drew Mahan and Don Borries (subpart a)
Title: Supervising Engineer – Sub/Relay Maintenance
Phone No.: 217-494-8676 , 217-821-4269

Prepared By: Riley Adams (subpart b)
Title: Manager - Electric Initiatives
Phone No.: 217-246-0213

Ameren Illinois objects to this data request to the extent it seeks information not relevant to the workshop process, and to the extent it does not further discussion and consideration of Ameren Illinois' Electric Distribution System Planning in the workshops, pursuant to 83 Ill. Admin. Code Sec. 475.220(b)(8). Ameren Illinois further objects to this request to the extent it seeks highly sensitive and confidential information that could pose a significant risk to the security of Ameren Illinois' system, and to the extent to the information sought is not likely to aid in the objectives set forth in 220 ILCS 5/16-105.17(e)(2). Ameren Illinois further objects to these requests as overly broad and unduly burdensome. Ameren Illinois further objects to these requests as vague and ambiguous, to the extent the terms "higher risk of failure", "reliability benefits", and "incremental costs" are undefined. Ameren Illinois further objects to these requests to the extent they assume that there is a relationship between the Company's asset replacement plans and reliability benefits, to the extent they assume that the Company calculates "incremental costs" with respect to "reliability benefits", and to the extent they assume the Company uses Copperleaf C55 software to identify assets "with a higher risk of failure". Subject to and without waiving these objections, Ameren Illinois states as follows:

a. Substation / Relay Maintenance Engineering

Please see AG-AIC 1.05 Attach 1 – AG-AIC 1.05 Attach 68. See AG-AIC 1.05 Attach 68, which can only be opened with RTS, a Doble Enoserv program. This file cannot be converted to Word or PDF, and may be viewed from Collinsville by appointment only.

b. Forestry

One long-term program that continues to see success is Vegetation Management's maintenance trimming cycle. Since 2012, Ameren Illinois has maintained a 4 - year maintenance trim cycle year to date. As a complement to our 4 - year cycle program, we improved our IVM (Integrated Vegetation Management) program, which includes right of way clearing and herbicide application. Ameren Illinois continues to monitor how trees affect the reliability of its lines. When planning for maintenance and/or off cycle work, vegetation managers reference Ameren Illinois reliability engineering dashboards which provide detailed outage information at the circuit level. This allows us to identify specific areas where tree conditions could be a problem and investigated further.

Circuit and pole inspections

Ameren Illinois' Circuit Inspection Program has been structured to enhance public and co-worker safety and to proactively address problems that might impact system reliability. Facilities covered by this program include all distribution and sub transmission circuits having voltages in the range of 2.4 kV through 69 kV. All inspections are being performed on a six-year cycle for the detailed visual inspections with a short-cycle visual inspection performed every two years on distribution circuits and annually on sub transmission circuits. Ameren Illinois will continue to evaluate the appropriate cycle length for these visual inspection programs.

The previously independent program of Pole Inspection and Treatment was incorporated into the Circuit Inspection Program in 2007. This portion continues to require that sub transmission and three-phase distribution poles are subjected to a full ground line inspection for strength assessment on a 12-year cyclical basis. Starting in 2020, Ameren Illinois discontinued the use of the sound and bore inspection process on single and two-phase distribution poles, and instead does a full ground line inspection on them. All types of poles are now inspected using the ground line excavation process on the same 12-year cycle. The ground line inspection involves excavating to determine if deterioration is present below ground. This process is a more accurate method than sound and bore to determine the health of a pole. Poles that pass the inspection are treated at the ground line with a preservative for life extension. Poles that fail the inspection are replaced or reinforced with a steel C-truss. C-trussing restores a pole back to its original strength or stronger.

Ameren Illinois continues to ensure that inspectors identify the correct issues as part of its inspection programs. Inspectors are trained at the beginning of each year, providing them with the most updated guidelines for equipment review. Quality control audits are performed on several inspections each month, and any issues found with inspectors are addressed through further training. Deficiencies found during circuit inspections are corrected immediately when an emergency, while all other issues are completed based on internal guidelines.

In 2015, Ameren Illinois began inspecting all of its sub transmission lines on an annual basis. Because of the significance of these lines with regards to the number of customers that could possibly be affected should a sub transmission outage occur. Ameren Illinois has begun inspecting these lines more frequently to ensure that the sub transmission system is consistently in good condition to avoid any major outages to large numbers of customers. These inspections will help identify possible pole weaknesses, as well as any hardware or vegetation issues, that could potentially cause outages in the future.

Starting in 2017, Ameren Illinois implemented changes to the distribution circuit inspection program in order to increase reliability and enhance the efficiency and effectiveness of the program. A new two-year Short Cycle inspection was implemented for distribution circuits to improve the likelihood of identifying high risk incipient issues before they adversely affect the safety and reliability of the feeder. The detailed Visual inspection was changed from four years to six years, while the Ground Line inspection will continue with a 12-year cycle. No changes were made to the annual sub transmission line inspection program. In addition, the pole replacement/restoration window has been revised to better plan and execute this work. This will allow time to better identify more effective alternatives to discrete replacement of multiple poles, such as the rerouting or re-spanning of a section of line.

Aerial patrols are utilized as another opportunity to assess the condition of Ameren Illinois facilities in order to improve reliability. The use of drones have also been used for storm damage assessment and day-to-day inspections as needed.

Device inspections

The Device Inspection Program utilizes the Circuit and Device Inspection System (CDIS) to track both the devices requiring inspection and the results of those inspections. Capacitor banks are inspected annually, while reclosers, regulators, and sectionalizers are inspected twice a year. Many repairs can be completed at the time of the inspection. However, deficiencies requiring follow up repair by a two-man or larger crew are also tracked to completion. In utilizing efforts in other areas (such as Voltage Optimization), devices that are connected via SCADA are not inspected as part of this inspection program and are monitored without a site visit. This is an example of how we are using technology to have a better view of our distribution grid, while also reducing our inspection costs.

Animal protection

Ameren Illinois identifies circuits on an annual basis where additional animal guarding could effectively improve reliability. Engineering reviews are completed and animal guards are installed. All new overhead distribution transformers continue to be purchased and installed with animal protection which are equipped with a clam shell type of guarding and insulated wire. In addition, animal guards continue to be installed on transformers as part of restoration work.

Because large numbers of customers are affected when substation outages occur, animal protection projects inside the substation provide Ameren Illinois with opportunities to significantly enhance system reliability. Protection can include installing an electric animal fence around substation equipment, installing spinners on overhead conductors to mitigate animal intrusion, and equipping energized facilities within the substation with insulated cover-ups. Smaller scale mitigation projects that require a maintenance outage are coordinated with other substation maintenance activities in order to minimize customer interruptions.

Multiple Device Inspections

The objective of the Multiple Device Interruption Program is to positively influence Ameren Illinois' SAIFI index by identifying and correcting problems on circuits and portions of circuits that are subject to frequent outages. The program initiates the review and remedial actions for facilities that have experienced three or more interruptions during the previous 12-month period. Central to the program is the Weekly Reliability Review Process in which a weekly report is generated that identifies all devices, including breakers, reclosers, and fuses, on the AIC system that meet the program criteria.

The outages are then reviewed by operating personnel and the appropriate facilities inspected. In many cases, the reviews determine that the underlying outage causes have already been addressed or will be addressed through existing planned work. However, in some cases corrective action is initiated. Many of these projects focused on some of the

same initiatives that are set up on a program basis, including lightning arrester installation, animal guarding, and underground cable replacement work. The Vegetation Management group also completes a similar Weekly Reliability Review Process when 50% or more of the outages that have occurred on the device are tree-related. The remediation work that results from these inspections is typically hot-spot trimming projects.

Lightning protection

Lightning protection has been identified by Ameren Illinois as a component of enhancing system reliability. The objective of lightning protection initiatives and projects is to reduce the likelihood of customer outages due to lightning strokes, thereby reducing the Company's SAIFI. Lightning protection initiatives and projects are developed and completed to enhance reliability.

Ameren Illinois has continued an initiative begun in 2009, the Lightning-caused Outage Reduction Program. The program utilizes past yearly lightning cause code data from the Company's Outage Management System to determine the highest priority work. Engineering work on the feeders take advantage of the Vaisala Fault Analysis and Lightning Location System (FALLS) data, along with circuit inspection data concerning arrester and pole ground placement and condition. From the circuits recommended for review, projects are engineered and completed.

Ameren Illinois also utilizes FALLS as part of its investigation into system events and disturbances when lightning is the suspected cause or if the cause of the interruption is unknown. FALLS, along with other analytical tools, is helping to identify issues, the correction of which will lead to improved system reliability.

Manhole and vault inspections

In 2014, Ameren Illinois began routine inspection of vault and manhole structures to ensure the safety of personnel and the general public. These inspections include structural checks of facilities for any condition that would affect the reliability of the system, physical integrity of the structure, and the safety of the public in or near the facilities.

c. See Ameren Illinois' objections, above.

d. See Ameren Illinois' objections, above.

e. See Ameren Illinois' objections, above.

f. See Ameren Illinois' objections, above.

No.: AG-AIC 1.06

Refer to the Company's response to 1.05 above, as well as to 83 IL Admin Code Part 475.100 dated December 13, 2021(Ameren Illinois PUBLIC Response to Part 475.100 in Advance Stakeholder Process at page 5), and the statement "Aided by the C55 valuation, investment decisions involve collaboration of Ameren Illinois personnel including but not limited to, engineering, operations, construction services, project costs, and executive leadership."

a. Provide the Company's policies and procedures regarding grid investment review and decision-making, including decision-makers, capital authorization levels, participants, contributors, meetings, materials, and other minimum requirements for authorization of grid-related capital project expenditures.
b. Provide any standardized templates for business cases, engineering analyses, operational analyses, project costs, project justifications, or other aspects of investment decisions that are provided as part of the grid investment review and decision-making policies and procedures provided in response to subpart (a) above.
c. Provide an example of a completed template or set of materials for a large "Reliability" project (per pages 2-3) authorized for implementation in accordance with the policy or procedure provided in response to subpart (a) above.
d. Provide an example of a completed template or set of materials for a large "System Growth" project (per pages 2-3) authorized for implementation in accordance with the policy or procedure provided in response to subpart (a) above.
e. Provide an example of a completed template or set of materials for a large "System Repair and Maintenance" project (per pages 2-3) authorized for implementation in accordance with the policy or procedure provided in response to subpart (a) above.
f. Provide an example of a completed template or set of materials for a large "Corporate/Segment Response" project (per pages 2-3) authorized for implementation in accordance with the policy or procedure provided in response to subpart (a) above.

RESPONSE

Prepared By: Steven R. Wolter
Title: Director, Asset & Risk Management
Phone No.: 217-403-4101

Ameren Illinois objects to this data request on the basis that it is overly broad and unduly burdensome, and not limited in scope or breadth. Ameren Illinois further objects to this request to the extent it seeks information that is not relevant to the workshop process or will further

discussion and consideration of Ameren Illinois' Electric Distribution System Planning in the workshops. Subject to and without waiving these objections, Ameren Illinois states as follows:

A) See AG-AIC 1.06 Attach 1-3.

B) See AG-AIC 1.06 Attach 4.

C) Reference EB 1.02 project J0J1B – Jerseyville to Piasa Jct Line – convert to 69kV.

D) Reference EB 1.02 project J085T – New 34.5kV line – Normal East to Normal Main.

E) Reference EB 1.02 project J0J4M – W Bridgeport Substation to Sumner – Rebuild 69kV and 12kV.

F) Reference EB 1.02 project J0Q1M – Workday Core System.

No.: AG-AIC 1.07

Refer to the Company's response to 83 IL Admin Code Part 475.100 dated December 13, 2021, (Ameren Illinois PUBLIC Response to Part 475.100 in Advance Stakeholder Process) and the historical reliability table presented on page 7.

a. This table is historical. Complete this table with actual values for 2021 along with projected values by year for 2022 through 2026, assuming that the capital investment plan provided on page 2 is implemented.
b. This table appears to include major event days. Please confirm this, and provide the same table of historical reliability data without major event days.
c. Refer to the table of historical reliability without major event days provided in response to subpart (b) above. Complete this table with actual values for 2021 along with projected values by year for 2022 through 2026, assuming that capital investment plan provided on page 2 is implemented.

RESPONSE

Prepared By: Matthew Sensenbach
Title: Manager, Distribution Planning and Reliability
Phone No.: 1-618-301-5270

Ameren Illinois objects to this data request to the extent it asks the Company to create or provide a document, work product, or analysis that did not exist prior to the data requests. Subject to and without waiving these objections, Ameren Illinois states as follows:

a)

Year	SAIFI	SAIDI	CAIDI
2021	1.16	194	168
2020	1.10	224	204
2019	1.20	179	149
2018	1.10	208	189
2017	1.17	191	164
2016	1.42	238	168
2015	1.43	352	246

AIC does not make projections for actual performance in future years. Any investments made towards projects that will reduce outage frequency and duration will continue these metrics on a downward trend.

b) Yes, the table presented on page 7 of AIC's response to 83 IL Admin Code Part 475.100 dated December 13, 2021, did not exclude major event days. The following table excludes major event days and calculates metrics as defined by IEEE Standard 1366.

Year	SAIFI	SAIDI	CAIDI
2021	0.88	134	118
2020	0.82	124	101
2019	0.99	133	132
2018	0.90	111	124
2017	0.90	118	131
2016	1.04	124	119
2015	1.04	130	125

c) See response to subparts (a) and (b) above.

No.: AG-AIC 1.08

Refer to the Company's response to 83 IL Admin Code Part 475.100 dated December 13, 2021, and Attachment 1, "Feeders with Potential for Reverse Power Flow".

a. Provide the confidential version of Attachment 1 with feeders identified.
b. Of the Feeders listed in the response to subpart (a) above, identify any actual incidents of reverse power flow recorded, including the dates, times, and magnitudes of each.
c. Of the incidents described in response to subpart (b) above, list and describe technical problems, customer complaints, or service interruptions associated with each incident.
d. Explain the technical issues and challenges associated with reverse power flow which the Company anticipates will require grid investments. In your response, be sure to distinguish between the technical issues and challenges associated with synchronous vs. asynchronous distributed generation. Provide any technical papers, research, or
e. Refer to the Company's response to subpart (d) above. Describe any investments the Company proposes to make to address the technical issues and challenges described. Explain exactly how the investment will address each technical issue or challenge described in subpart (d).

RESPONSE

Prepared By: Andy Parker
Title: Manager, DER Integrations Strategies
Phone No.: 618-610-1613

a. See AG-AIC 1.08 Attach 1 (CP). Note that the attachment includes feeders in which the substation feeder head has the potential for reverse power flow based on max DER penetration and minimum load during daylight hours. Ameren Illinois has also experienced actual reverse power flow on limited line regulators.

b. The list of feeders with potential for reverse power flow was formulated during Ameren Illinois annual load analysis process based on a minimum load during daylight hours and maximum DER output scenario. Ameren Illinois is seeing a steady growth of DER penetration, therefore it is likely that the list of feeders experiencing reverse power flow continues to grow. Please see AG-AIC 1.08 Attach 1 (CP) showing dates, times, and magnitudes of feeders that have experienced reverse power flow based on ADMS (SCADA) data.

c. Ameren Illinois' existing customer complaint process does not have a method or query capability to track to the level of complaints due to reverse power flow. Ameren Illinois attempts to mitigate these issues through the interconnection process (analysis, design and witness test), therefore the number of issues have been very minimal. With that being said, there have been limited instances in which regulators did not regulate voltage properly due to control settings not being updated as DER interconnects to levels warranting a settings change. Without proper settings, the regulators may get confused and potentially regulate voltage inaccurately during times of reverse power flow. Ameren Illinois has worked with their primary regulator control vendor to further understand which settings are suited for a variety of scenarios.

d. Ameren Illinois' distribution circuits are primarily designed for radial operation. The radial design utilizes single phase voltage regulators and three-phase substation transformer LTC's to maintain the proper voltage levels. These devices are set up to assume the normal direction of real power flow (watts) is from the substation to the load, and that the strongest voltage source is upstream of the voltage regulator (substation side). The addition of generation (both synchronous and asynchronous) can change the direction of real power flow through the regulator, as well which side of the regulator should be used to sense voltage (as an inverter based DER also attempts to regulate the voltage). Circuits upon which this occurs become more like a network than a radial circuit. The voltage regulators and LTC's with the proper microprocessor controls can be set to handle these situations when they are identified through studies in advance. If the proper controls are not existing, they are replaced along with adding SCADA metering for monitoring proper operation.

Another concern with reverse power flow is the potential for a load/generation match scenario on a hydraulic recloser, or other protective equipment where the automatic reclosing interval cannot be adjusted. Hydraulic reclosers have been deployed on the distribution system for many years, and they may be present as protective devices in substations and on the line. Hydraulic reclosers are designed to wait two seconds before attempting a reclose after the first trip, but there is some variance in how quickly the device operates. This is not a concern on a load-only circuit, but the introduction of generation adds the possibility of the recloser closing into another power source out of phase. In a load/generation match scenario, a smart inverter's anti-islanding detection can take longer than the required two seconds to detect a loss of utility source and disconnect. If this were to occur on a generation connected feeder during a load/generation match scenario, then the recloser may close into the generation out of phase. AG-AIC 1.08 Attach 2 is an EPRI whitepaper that notes that passive island detection methods, typically the fastest and most reliable methods, may not work during the load/generation match scenario.

A similar load/generation match scenario may temporarily form an unintentional island at a substation or sub-transmission circuit level. In both of those cases, if a three-phase protective device operation creates a temporary island on the high side of the substation transformer because that device opened for a single phase to ground fault, then the distributed generation can increase the duration of the ground fault overvoltage (GFOV) experienced on the line. AG-AIC 1.08 Attach 3 is an EPRI whitepaper that discusses GFOV and its relationship with DER, as well as the effects of temporary overvoltage on surge arresters. This type of event will cause overvoltage on most substation transformer high side surge arresters, which greatly shortens the

life of the arresters and increases the possibility of damage to other substation devices during their failure.

As reverse power flow becomes increasingly common on the distribution system due to the increased proliferation of DER, thermal loading constraints will become more relevant in screening for the potential impacts of distributed generation. Currently, while Ameren Illinois does not have any instances of a generator causing a thermal loading issue due to reverse power flow, interconnection applications are reviewed to ensure that proposed generation will not overload any distribution system devices or conductors.

e. The use of screening for potential reverse power flow during the DER application review process has prevented the issues outlined in part d. from occurring on Ameren Illinois' distribution system. As mentioned in part d., any voltage regulators or LTC's that could experience reverse power flow must be fitted with the proper controls that can be set to handle bi-directional power flow due to DER and have SCADA monitoring installed. Similar screening is used to identify and replace or relocate any hydraulic reclosers that could experience reverse power flow. In the case of replacement, an electronically controlled device with an adjustable reclose time is installed with a reclose delay of five seconds.

The ratings of surge arresters on the high side of delta connected distribution transformers are evaluated to determine if reverse power flow during a line to ground fault would necessitate a higher voltage rated arrester if either of the following conditions exist:

1) The transformer could experience reverse flow under minimum daytime loading conditions and it is protected by a circuit switcher or breaker (three phase tripping device that could separate a bushing or arrester ground fault from all other load on the sub-transmission source)
2) The aggregate DER connected to the sub-transmission line supplying the transformer would be large enough to support the minimum loading of the line when the source breaker trips for a ground fault (if there is not enough to ensure fast reaction of inverter anti-islanding controls in a load/generation match scenario, e.g. direct transfer trip for the generation from the sub-transmission source protective device).

NOTE: AG-AIC 1.08 Attach 1 is designated CONFIDENTIAL & PROPRIETARY and should be treated as such.

Ameren Illinois Company's
Response to Illinois Office of Attorney General Data Request - AG-AIC 1
Grid Plan Workshops
Workshops under Sec. 16-105.17(e) to inform a Multi-Year Integrated Grid Plan
Dated Submitted: February 18, 2022

No.: AG-AIC 1.09

Refer to the Company's response to 83 IL Admin Code Part 475.100 dated December 13, 2021, and the description of 1) the annual distribution planning process ("Load Analysis") on page 4; and 2) the 5-year planning process for the subtransmission network on pages 4 and 5.

a. Provide the Company policies and procedures related to the annual distribution planning (Load Analysis) process.
b. Provide the Company policies and procedures related to the 5-year subtransmission network planning process.

RESPONSE

Prepared By: Matthew Sensenbach
Title: Manager, Distribution Planning and Reliability
Phone No.: 1-618-301-5270

a) Please see AG-AIC 1.09 Attach 1-3.

b) Please see AG-AIC 1.09 Attach 4.

Ameren Illinois Company's
Response to Illinois Office of Attorney General Data Request - AG-AIC 1
Grid Plan Workshops
Workshops under Sec. 16-105.17(e) to inform a Multi-Year Integrated Grid Plan
Dated Submitted: February 18, 2022

No.: AG-AIC 1.10

Refer to the Company's response to DR 1.01 above, which includes SAIDI and SAIFI data by circuit. Please provide two color-coded maps of the Company's service territory with every circuit listed response to DR 1.01 indicated. Please use one color-coded map for the SAIDI data by circuit, and one color-coded map for the SAIFI data by circuit. Please use a different color for each of the five SAIDI and SAIFI performance ranges listed below for each map:

a. Top quintile (20%) of circuits with the lowest (best) SAIDI and SAIFI
b. Second quintile of circuits with the second lowest (next best) SAIDI and SAIFI
c. Third quintile of circuits with the third lowest (next best) SAIDI and SAIFI
d. Fourth quintile of circuits with the fourth lowest (next best) SAIDI and SAIFI
e. Bottom quintile of circuits with the worst SAIDI and SAIFI.

RESPONSE

Prepared By: Matthew Sensenbach
Title: Manager, Distribution Planning and Reliability
Phone No.: 1-618-301-2570

Ameren Illinois objects to this data request on the basis that it is overly broad and unduly burdensome. Further, this request assumes the Company maintains the information in the form requested in the ordinary course of business. Therefore, Ameren Illinois objects to this request to the extent it asks for new analyses and information that Ameren Illinois does not prepare or maintain in the ordinary course of business and that Ameren Illinois is not obligated to prepare or maintain in the form requested.

Furthermore, Ameren Illinois objects to this data request on the basis that it is premature in that it seeks the stratification of SAIDI data; such a request is inappropriate because the SAIDI data this data request seeks is currently the subject of active litigation in Docket No. 22-0063.